

REMARKS

Claims 1-12, 24, 26-33, 44, 46-53, 64, 66, 68-70 and 72-87 are pending. The Office Action dated April 14, 2009 in this Application has been carefully considered. The above amendments and the following remarks are presented in a sincere attempt to place this Application in condition for allowance. Claims 1, 2, 24, 44, 64, 66, 68, 69, 70, 74, 80, and 84 have been amended in this Response. Claim 82 has been cancelled without prejudice. Reconsideration and allowance are respectfully requested in light of the above amendments and following remarks.

Applicant has amended dependent Claim 84 to include “sulfur hexafluoride” in the list of gases that the gas atmosphere is selected from. No new matter has been added, and support for this amendment may be found at least on page 10, lines 16 – 25 of the Application.

Claims 81 and 83 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The drawings were also objected to as failing to show every feature of the claim. Figure 6 has been added to show the claimed features of the term “additional material” of Claims 81 and 83. Applicant submits that these amendments to Figure 6 do not disclose new subject matter, and that these amendments are supported by the original Application as filed. In particular, Applicant directs the Examiner to page 11, lines 13 – 21 of the Application as originally filed, which in part states the following:

*[A]dditional material may be deposited onto the wafer. Typically, the **additional material is to increase the hermeticity** of the packaged microcavity. However, step 113 may be necessary depending on the desired application. The additional material can be the same or similar material to structural layer and depends on desired electrical properties. For example, for an RF MEMS application, the additional material can be Silicon Dioxide (SiO₂) or Silicon Nitride (Si₃N₄). (Emphasis added.)*

The above cited embodiment of Claims 81 and 83 are cited for illustration purposes only and are not intended to limit the scope of the claims to any one embodiment. In the cited embodiment, it would

be clear to persons of ordinary skill that the depositing of additional material onto the wafer as part of step 113 would position the additional material adjacent to the layer of protective material 520, since in step 112 the protective material 520 was cured or fixed onto the wafer. The protective material 520 would be the outermost layer and any further depositing of material onto the wafer would place the additional material 560 adjacent to the protective material 520, as shown now in Figure 6. Therefore, Applicant requests that the rejection of Claims 81 and 83 be withdrawn.

The Specification and Drawings have been amended to address the Examiner's objection to the drawings. The Examiner submitted that the drawings must show "additional material being formed adjacent to protective material" in order to be claimed. In this response, Applicant has added Figure 6 to show that the additional material 560 is deposited adjacent to the protective material 520. Applicant has amended the brief description of the drawings and the portion of written description that refers to the additional material 560 to provide adequate support for the claimed additional material of Claims 81 and 83.

In citing and amending these portions of the Application, however, Applicant in no way intends to limit the scope of the claim to only the referenced embodiment. As discussed above, Applicant submits that these amendments to the specification and drawings do not disclose new subject matter, and that these amendments are supported by the original Application as filed. Accordingly, Applicant respectfully requests that these objections be withdrawn.

Claims 2, 64 and 74 have been amended as follows:

- *Claim 2: wherein the operation of depositing the protective material adjacent the housing of structural material overlaying at least one of the one or more apertures in an amount sufficient to substantially close the overlaid one or more apertures without the protective material being deposited on the device or any substrate*

underlying the housing, further comprises: providing a gas atmosphere *within the housing*, wherein the pressure is greater than or equal to 1 Pascal (Pa). (Emphasis added.)

- *Claim 64: depositing the protective material adjacent to the housing in an amount sufficient to substantially close the at least one aperture without entering the housing sufficiently to interfere with operation of the device, wherein a gas atmosphere is provided at a first pressure greater than or equal to 1 Pascal (Pa) and a first temperature less than 600° Celsius (C).* (Emphasis added.)
- *Claim 74: wherein the operation of depositing the protective material adjacent to the housing further comprises* providing a gas atmosphere about the device *within the housing*, wherein the pressure is greater than or equal to 1 Pascal (Pa). (Emphasis added.)

Both Claims 2, 64 and 74 have been amended to clarify the relationship between the operation of depositing the protective material and providing a gas atmosphere and temperature, as claimed. Support for this amendment is found at least on page 10, lines 16 – 25 of the Application. The Applicant submits that these amendments are no more than tangentially related to the patentability of the claims. No equivalents, therefore, are intended to be surrendered.

Claims 1, 24, 26, 30, 32, 44, 46, 50, 52, 68, 69, 70, 73, 75, and 77-80 stand rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent Publication No. 2001/0004085 to Gueissaz (“Gueissaz”). In light of the amendments submitted herewith, Applicant respectfully submits that the rejection has been overcome. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

Rejected independent Claim 1 as now amended more particularly recites one of the distinguishing characteristics of the present invention, namely, “applying a layer of *non-metallic structural material* adjacent to the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material.” (Emphasis added.) Support for this Amendment can be found, among other places, on page 7, lines 19 – 25 and page 8, lines 1 - 13 of the Application as originally filed.

Regarding Claim 1, Gueissaz was cited as assertedly fully disclosing “applying a layer of structural material (9)”. The Examiner cites Figure 21 showing a liquid solder wave 23 being applied over layer 9. *Gueissaz, however, does not suggest, teach, or disclose that the material forming the layer 9 of Gueissaz is non-metallic.* Specifically, Gueissaz teaches the layer 9 is made of metal, “in particular gold or gold alloy.” See Gueissaz, page 7, paragraph [0106].

It would have been known that solder is a metallic compound, and that liquid solder could not have been applied to a non-metallic housing. Liquid solder does not adhere to non-metallic surfaces. Therefore, there would have been no reason or technical rationale to apply the solder deposition techniques of Gueissaz to the claimed non-metallic housings of Claim 1.

In view of the foregoing, it is apparent that the cited reference does not teach the unique combination now recited in amended Claim 1. Applicant therefore submits that amended Claim 1 is clearly and precisely distinguishable over the cited references in a patentable sense, and is therefore allowable over this reference and the remaining references of record. Accordingly, Applicant respectfully requests that the rejection of amended Claim 1 under 35 U.S.C. §102(b) be withdrawn and that Claim 1 be allowed.

Applicant contends that the rejections of amended Claims 24, 44, 68, 69, 70, and 80 are overcome for at least some of the reasons that the rejection of Claim 1 as amended is overcome. These reasons include Gueissaz not disclosing, teaching, or suggesting the following:

- “forming *a non-metallic housing* over the device,” as claimed in Claim 24;
- “forming *a non-metallic housing* over the device,” as claimed in Claim 44;
- “applying a layer of *non-metallic structural material* adjacent to the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material,” as claimed in Claim 68;
- “forming *a non-metallic housing* over the device,” as claimed in Claim 69;
- “forming *a non-metallic housing* over the device,” as claimed in Claim 70; and
- “covering the sacrificial material with *a non-metallic housing* of structural material,” as claimed in Claim 80.

As now amended each claim referred to above claims a non-metallic housing, except Claim 60, which recites “a layer of non-metallic structural material.” Gueissaz does not teach, disclose, or suggest that the layer 9 of Gueissaz should be made from anything except metal. Applying liquid solder to a non-metallic housing would not produce an operable device, because the solder would not adhere to the non-metallic housing and, therefore, would not seal the apertures 10, as intended. Accordingly, there is no reason or rationale that liquid solder would have been applied to a non-metallic housing.

Claims 26, 30, and 32 depend from and further limit Claim 24. Hence, for at least the aforementioned reasons that Claim 24 should be deemed to be in condition for allowance, Claims 26, 30, and 32 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 26, 30, and 32 also be withdrawn.

Claims 46, 50, and 52 depend from and further limit Claim 44. Hence, for at least the aforementioned reasons that Claim 44 should be deemed to be in condition for allowance, Claims 46, 50, and 52 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 46, 50, and 52 also be withdrawn.

Claims 73, 75, 77, 78, and 79 depend from and further limit Claim 70. Hence, for at least the aforementioned reasons that Claim 70 should be deemed to be in condition for allowance, Claims 73, 75, 77, 78, and 79 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 73, 75, 77, 78, and 79 also be withdrawn.

Claims 32, 33, 52 and 53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gueissaz. Claims 32 and 33 depend from and further limit Claim 24. Hence, for at least the aforementioned reasons that Claim 24 should be deemed to be in condition for allowance, Claims 32 and 33 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 32 and 33 also be withdrawn.

Claims 52 and 53 depend from and further limit Claim 44. Hence, for at least the aforementioned reasons that Claim 44 should be deemed to be in condition for allowance, Claims 52 and 53 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 52 and 53 also be withdrawn.

Claims 2, 7, 10, 11, 12, 64, 74 and 84-86 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gueissaz in combination with U.S. Patent No. 5,485,037 by Marrs (“Marrs”) and U.S. Patent No. 4,480,975 by Plummer et al. (“Plummer”). Claims 2, 7, 10, 11, and 12 depend from and further limit Claim 1. Hence, for at least the aforementioned reasons that Claim 1 should be deemed to be in condition for allowance, Claims 2, 7, 10, 11, and 12 should be

deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 2, 7, 10, 11, and 12 also be withdrawn.

Applicant contends that the rejection of amended Claim 64 is overcome for at least some of the reasons that the rejection of Claim 1 as amended is overcome. These reasons include Gueissaz not disclosing, teaching, or suggesting “forming a *non-metallic housing* over the device.” (Emphasis added.) Applicant respectfully requests that the rejection of independent Claim 64 also be withdrawn.

Claim 74 depends from and further limits Claim 70. Hence, for at least the aforementioned reasons that Claim 70 should be deemed to be in condition for allowance, Claim 74 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejection of dependent Claim 74 also be withdrawn.

Claims 84 - 86 depend from and further limit Claim 1. Hence, for at least the aforementioned reasons that Claim 1 should be deemed to be in condition for allowance, Claims 84 - 86 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 84 - 86 also be withdrawn.

Claims 3 – 5, 8, 27, 47, 48, and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gueissaz in combination with U.S. Patent No. 7,008,812 to Carley (“Carley”). Claims 3 – 5 and 8 depend from and further limit Claim 1. Hence, for at least the aforementioned reasons that Claim 1 should be deemed to be in condition for allowance, Claims 3 – 5 and 8 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 3 – 5 and 8 also be withdrawn.

Claim 27 depends from and further limits Claim 24. Hence, for at least the aforementioned reasons that Claim 24 should be deemed to be in condition for allowance, Claim 27 should be

deemed to be in condition for allowance. Applicant respectfully requests that the rejection of dependent Claim 27 also be withdrawn.

Claims 47 and 48 depend from and further limit Claim 44. Hence, for at least the aforementioned reasons that Claim 44 should be deemed to be in condition for allowance, Claims 47 and 48 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 47 and 48 also be withdrawn.

Claim 76 depends from and further limits Claim 70. Hence, for at least the aforementioned reasons that Claim 70 should be deemed to be in condition for allowance, Claim 76 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejection of dependent Claim 76 also be withdrawn.

Further regarding Claims 5 and 48, the Examiner cites Carley as teaching a structural material composed of a photoresist or polymide or selected from a group of Silicon Dioxide and Silicon Nitride. Applicant respectfully points out that none of the claims claim that a structural material is made of a photoresist or polymide. Also, it would not have been obvious to apply the soldering techniques of Gueissaz to Carley, because liquid solder could not have been applied to the materials Silicon Dioxide and Silicon Nitride disclosed in Carley. Liquid solder would not adhere to these surfaces. In addition, Carley teaches methods of depositing a metallic layer by *using sputtering or chemical vapor deposition*; these methods and the materials incorporated for deposition would have been adapted for application to Silicon Dioxide and Silicon Nitride. Therefore, there would have been no reason or technical rationale to apply the solder application techniques of Gueissaz to the claimed non-metallic housings of Carley.

Claims 28, 29, 31, 49, 51 and 72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gueissaz in combination with U.S. Patent Publication No. 2004/0046835 by

Yang et al. (“Yang”). Claims 28, 29, and 31 depend from and further limit Claim 24. Hence, for at least the aforementioned reasons that Claim 24 should be deemed to be in condition for allowance, Claims 28, 29, and 31 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 28, 29, and 31 also be withdrawn.

Claims 49 and 51 depend from and further limit Claim 44. Hence, for at least the aforementioned reasons that Claim 44 should be deemed to be in condition for allowance, Claims 49 and 51 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejections of dependent Claims 49 and 51 also be withdrawn.

Claim 72 depends from and further limits Claim 70. Hence, for at least the aforementioned reasons that Claim 70 should be deemed to be in condition for allowance, Claim 72 should be deemed to be in condition for allowance. Applicant respectfully requests that the rejection of dependent Claim 76 also be withdrawn.

Applicant has now made an earnest attempt to place this Application in condition for allowance. For the foregoing reasons and for other reasons clearly apparent, Applicant respectfully requests full allowance of Claims 1-12, 24, 26-33, 44, 46-53, 64, 66, 68-70, 72-81, and 83 - 87.

Applicant does not believe that any fees are due; however, in the event that any fees are due, the Director is hereby authorized to charge any required fees due (other than issue fees), and to credit any overpayment made, in connection with the filing of this paper to Deposit Account No. 50-0605 of CARR LLP.

Should the Examiner deem that any further amendment is desirable to place this application in condition for allowance, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

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